TACTICAL LOGISTICS DATA DIGITIZATION

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Introduction

Tactical Logistics Data Digitization (TLDD) is the collaboration of multiple information technology initiatives that will result in automating current supply and maintenance processes to reduce paper and clerical errors on the battlefield. TLDD serves as a digital capability to extract logistically significant data from weapon system platforms and then transmit that information into Standard Army Management Information Systems (STAMIS) such as the Unit Level Logistics System (ULLS), the Standard Army Maintenance System (SAMS), and eventually the Global Combat Service Support-Army (GCSS-A) and the Combat Service Support Control System.

TLDD is used in both a hardwire mode and, where appropriate, wireless linkage between STAMIS nodes. This digital capability moves logistics data requirements quickly, accurately, and efficiently while providing heretofore-unrealized logistics situational awareness to operational commanders. TLDD is considered a critical enabler for logistics transformation, supporting both prognostic and diagnostic efforts on the battlefield. TLDD is also an extension of the Joint Computer-Aided Acquisition and Logistics Support (JCALS) Program infostructure provided to platform operators and mechanics on the battlefield.

JCALS

With the Army as the executive agent, JCALS success stories include the Navy's use of JCALS to rebuild the USS Cole after the terrorist attack on it several years ago, the Air Force's use of JCALS in the F-22 Program, and the digitization of more than 15,000 Army publications by the U.S. Army Materiel Command for increased efficiency. In support of TLDD, JCALS has already provided Electronic Technical Manual (ETM) readers to the Army Training and Doctrine Command schoolhouses. Further, in coordination with the Project Manager, Logistics Information Systems, JCALS and TLDD will also provide ETM readers to mechanics as well as provide hand-held technology (i.e., personal digital assistants (PDAs)) to selected weapon system operators in support of GCSS-A.

Funded by an FY02 congressional plus-up to extend technical data to warfighters and tactical users, and to facilitate greater support and training to the user community, the JCALS Program Office was designated by the Program Executive Office, Enterprise Information Systems (PEO, EIS) to execute these funds. TLDD is an extension of the JCALS mission to provide authorized and current technical data in digital format to users. PEO, EIS, through the JCALS Program Office, appointed a Project Officer for TLDD who will ensure data conversion of ETMs from Portable Data File to eXtensible Markup Language (XML), develop a "point-and-click" integrated parts selection (IPS) and a Digital Log Book (DLB) capability to facilitate Digital Preventive Maintenance Checks and

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Services (DPMCS), and develop an Electronic Technical Manual-Interface (ETM-I) functionality. These resources will allow authorized operators and maintainers to digitally requisition spare and repair parts through IPS and move these requests digitally to STAMIS ULLS and SAMS virtually free of clerical errors. Ultimately, TLDD will link operators and maintainers to the retail and wholesale logistics systems through the World Wide Web.

Ideally, the transmission of logistics data will happen wirelessly from as far forward of the Brigade Support Area as the Combat Repair Team and operator locations.

Data Transmission

DLB/DPMCS, ETM-I, and the wireless transmission of logistics data have been successfully demonstrated at the 46th Corps Support Group (CSG), Fort Bragg, NC. In addition, ETM-I has been integrated into the wireless Combat Service Support Automated Information System Interface network within the Stryker Brigade Combat Team at Fort Lewis, WA. The catalyst behind these concepts was the need for the Army to provide a diagnostic capability to isolate and troubleshoot mechanical faults, to provide an automated capability to process maintenance fault data to requisition parts through ULLS-Ground (ULLS-G), and to create and process digital work orders through SAMS-1. Additionally, there was a need to evaluate a variety of hardware solutions to perform fault diagnostics, generate and perpetuate data, and determine the use of wireless technologies to distribute maintenance data.

Digital Interface

To accomplish these objectives, the U.S. Army Logistics Integration Agency (USALIA) developed and employed a digital interface between the mechanic and ULLS-G/SAMS-1 referred to as ETM-I. ETM-I is a non-intrusive software interface between the U.S. Army's ETMs and Interactive-ETMs (I-ETMs) and the ULLS-G and the SAMS-1. ETM-I allows Army mechanics to input maintenance faults and identify required repair parts from the ETM/I-ETM as well as transmit parts requests and maintenance information in an automated manner.

ETM-I provides operators and mechanics an interface to enable them to point and click on a part number or National Stock Number to electronically create a parts demand and forward the requisition to either ULLS-G, SAMS-1, or, in the future, to GCSS-A for processing. Using ETM-I reduces clerical errors, supports DA Form 5988-E updates, streamlines the unit requisition process, and decreases fault entry time.

Within the 46th CSG, the 503rd Maintenance Company has been equipped with ETM-I, SAMS-1, and ULLS-G; and the 546th Transportation Company has been equipped with ETM-I and ULLS-G. The benefits of ETM-I are reflected in the Class IX requisition history for the 546th Transportation Company before and after receiving ETM-I and ULLS-G. From August 1999 through July 2000, using the traditional requisition process, 405 requisitions were submitted. Of those, 53 requisitions (13 percent) were for the wrong part. In the following year (August 2000-July 2001), with the implementation of ETM-I, 1,004 requisitions were submitted, with only 10 incorrect requisitions (1 percent). This clearly demonstrates the significant improvement and benefit in processing Class IX requisitions offered by ETM-I and ULLS-G.

Use Of PDAs

The use of hand-held DLB technology such as PDAs to perform preventive maintenance checks and services (PMCS) is also being evaluated. DPMCS is the automation of the maintenance checks and services process defined in TM-10 manuals and performed by operators, combined with the DA Form 5988-E information, to record faults and repair parts requirements for a piece of equipment. This is done using a PDA. The PDA displays the correct PMCS for the respective model of the bumper number vehicle, all open parts requests, all open faults, the next service due (type, date, and miles; kilometers or hours), and the recorded usage.

The PDA also allows updates. As the operator performs the PMCS, if a fault is noticed, the operator may add the fault with little or no keystroke entry. Upon completing the PMCS, the information is transferred through the ETM-I to ULLS-G for processing. To date, the PMCS checklists for High Mobility Multipurpose Wheeled Vehicles, Light Medium

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Tactical Vehicles, Family of Medium Tactical Vehicles, and Heavy Expanded Mobility Tactical Trucks have been converted for use on the PDA device.

The Combined Arms Support Command is sponsoring a Concept Experimentation Program (CEP) for performing PMCS using a PDA device. The 546th Transportation Company has been taking part in the CEP. In June 2001, the U.S. Army Test and Evaluation Command Operational Test Command Coordination Office conducted a data collection/evaluation at the 546th while the unit was operating in a field environment. An advantage of using PDA devices is that the soldier can review the PMCS table and update the information contained in the DA Form 5988-E simultaneously. This ensures that soldiers execute a complete PMCS and increases information flow and accuracy, which leads to a quicker update of DA Form 5988-E. The successful demonstration of the TLDD concept at Fort Bragg is the first step in Army implementation of this concept.

Ideally, the transmission of logistics data will happen wirelessly from as far forward of the Brigade Support Area (BSA) as the Combat Repair Team and operator locations. There are several systems being reviewed by various agencies within the Army to make this a reality. To help determine the most effective approach, USALIA recently completed a study titled *Tradeoff Analysis for Combat Service Support Wireless Communications Alternatives*. This study identified combat service support (CSS) communications connectivity requirements, compared available wireless technologies that could be implemented to meet these requirements, conducted an evaluation of those technologies to determine which are most feasible and cost-effective, and provided a report with recommendations to interested parties. USALIA then held a CSS Wireless Communications Workshop to bring interested parties together to make recommendations to the Army leadership. While those recommendations are under review, a proof of concept demonstration of how logistics data can be moved wirelessly was conducted at Fort Bragg. Instead of moving logistics data with paper documents and/or magnetic diskettes, the data were successfully moved wirelessly using satellite and cellular phones via PDA from the operator platforms through the mechanic and supervisor using ETM-I to the ULLS-G, SAMS, and Standard Army Retail Supply System.

Additionally, at Fort Lewis, ETM-I has been successfully integrated into the Wireless Combat Service Support Automation Information System Interface. This has reduced clerical errors, the number of paper DA Forms 2404 and 5988-E, and excess repair parts. Additionally, it has eliminated lost high-priority parts requests and the ordering of wrong parts and has increased turnaround time. Enabling logisticians to do this beyond the BSA and as far forward as likely combat repair team/operator locations is the next challenge and one that the recommendations from the above-mentioned communications workshop seeks to address.

Conclusion

As stated in FM 3-0, CSS, like all other battlefield operating systems, is the business of commanders, and is an enabling operation that generates and sustains combat power. CSS characteristics, as defined in FM 3-0, are responsiveness, simplicity, flexibility, attainability, sustainability, survivability, economy, and integration. The TLDD concept supports all of these characteristics. Once implemented, the TLDD concept will contribute at the unit level to the Army G-4's transformation charter to reduce the CS/CSS footprint in the combat zone and reduce the cost of logistics without reducing warfighting capability or readiness.

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